Water Science and Technology Board

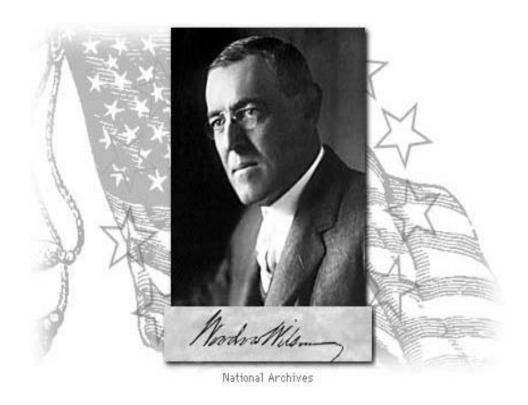


Purposes

- to advance science and technology
- to advise government
 - on policy for science institutions
 - on applications of science to policy

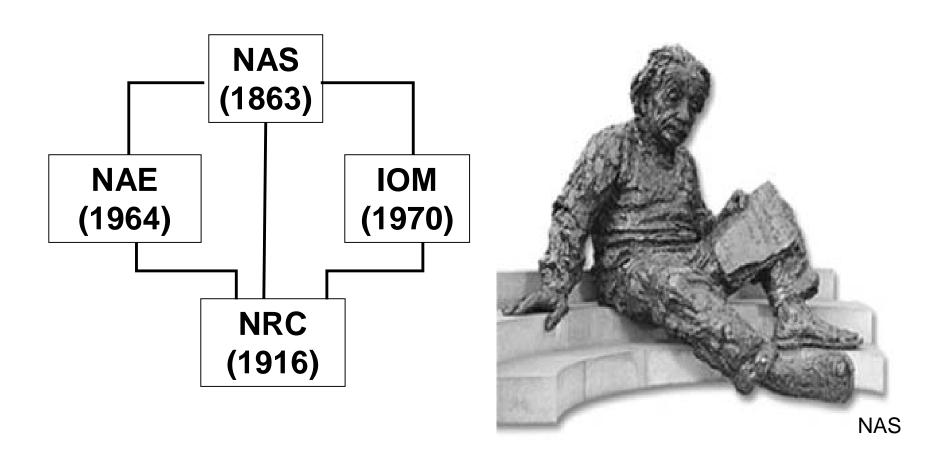
National Research Council (NRC) is the operating arm of NAS

Created in 1916 in response to the threat of World War I





The Academy Complex





WSTB Mission

The NRC's Water Science and Technology Board carries out studies related to water resources accomplished under the aegis of the National Academy of Sciences and the National Academy of Engineering. The board's objective is to improve the scientific and technological basis for resolving important questions and issues associated with the efficient management and use of water resources.



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WSTB Reports



Riparian Areas: Functions and Strategies for Management (2002)*

Compensating Wetland Losses Under the Clean Water Act (2002)*

The Missouri River Ecosystem: Exploring the Prospects for Recovery (2002)*

Assessing the TMDL Approach to Water Quality Management (2001)

Classifying Drinking Water Contaminants for Regulatory Consideration (2001)

Inland Navigation System Planning: The Upper Mississippi River-Illinois Waterway (2001)*

Aquifer Storage and Recovery in the Comprehensive Everglades Restoration Plan (2001)*

Investigating Groundwater Systems on Regional and National Scales (2000)

Clean Coastal Waters: Understanding and Reducing the Effects of Nutrient Pollution (2000)*

Risk Analysis and Uncertainty for Flood Damage Reduction Studies (2000)*

Natural Attenuation for Groundwater Remediation (2000)

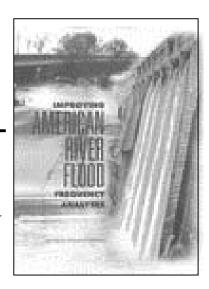
Watershed Management for Potable Water Supply: Assessing the New York City Strategy (2000)

Ecological Indicators for the Nation (2000)

Downstream: Adaptive Management of Glen Canyon and the Colorado River Ecosystem (1999)

Improving American River Flood Frequency Analyses

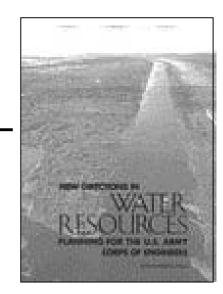
•Recommended a flood distribution based on systematic record of a 3-day flood flows and on historical records.



- •The uncertainties associated with in the 100-year flood estimates are so large that a specific flood risk management strategy should be developed for the Sacramento area that addresses the significant risk of flooding.
- •Establish a new interagency research effort that emphasizes flood risk assessment and management and coordinated flood risk reduction.

New Directions in Water Resources Planning for the U.S. Army Corps of Engineers

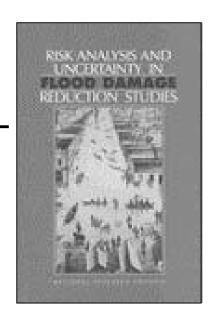
•Shortening the Corps' planning procedures will not necessarily result in better water resources planning.



- •The duration and cost of the Corps' planning process do not take longer than the planning of similar private sector water projects and therefore reasonable.
- •A serious challenge to the Corps is to resolve the tensions between national and local goals: as a national steward of the nation's waters and responding to the goals and interests of its local sponsors.

Risk Analysis and Uncertainty in Flood Damage Reduction Studies

•Structure-to-structure calculations of risk and benefits rather than on damages aggregated over groups of structure in damage reaches.



- •Corps should explicitly address social and environmental benefits in its risk analysis by quantifying to the extent possible and including these benefits within the National Economic Development water resources planning alternative.
- •Use annual exceedance probability as a measure of engineering risk.

Inland Navigation System Planning: The Upper Mississippi River-Illinois Waterway

- •The Corps should explore other options for managing barge traffic—including scheduling systems—before it considers extending several locks on the UMRIW System.
- •The Corps should seek solutions to waterway congestion that will prove beneficial over a range of possible future waterway traffic scenarios.
- •Economic analyses should be better integrated with environmental aspects of the feasibility study to offer a more comprehensive assessment of the effects of proposed options.
- •The cumulative effects of the current navigation system should be more carefully evaluated.

Compensating for Wetland Losses Under the Clean Water Act

- •Greater consideration should be given on how restored or newly created wetlands can replicate the ecological functions of naturally occurring wetland.
- •The magnitude of loss of wetland is not precisely known since not enough data are kept on the ecological status of wetlands that are lost or those that are restored or created.
- •Restoration or creation of a wetland should occur simultaneously or before the filling of natural wetland according to established design criteria that are better monitored and enforced regardless of who mitigates.
- •Recommended a Corps national database to track wetland area and functions gained and lost and to encourage the establishment of organizations to monitor mitigated sites.

The Missouri River Ecosystem: **Exploring the Prospects for Recovery**



- •The river's ecosystem's degradation will continue unless its natural flows are significantly restored.
- •Halt further revision of the Master Manual until the changes reflect a science-based collaborative approach to Missouri River management.
- •Congress should pass a Missouri River Protection and Recovery Act to keep river managers focused on improving the ecosystem.
- •Congress should authorize the Corps to set different water-release schedules for different segments of the river.

WATER FOR THE FUTURE

THE WEST BANK AND GAZA STRIP, ISRAEL, AND JORDAN



U.S. NATESSAL ACADEMY OF STREETS
ROSAL SCRIPTING SOCIETY OF JURIAN
JURIAL ACADEMY OF SCRIPTS AND PROMORTIES
BALESTON ACADEMY FOR SCRIPTS AND TREEDSCROOT.

Principles



- Take a regional view
- Account for present and future generations
- Consider all options
- Integrate quantity and quality
- Maintain ecosystem services



WRDA 2000

Section 216

INDEPENDENT PEER REVIEW OF PROJECTS

The Academy shall study the practicality and efficacy of the independent peer review of the feasibility reports, including--

- (A) the cost, time requirements, and other considerations relating to the implementation of independent peer review; and
- (B) objective criteria that may be used to determine the most effective application of independent peer review to feasibility reports for each type of water resources project.

INDEPENDENT PEER REVIEW OF METHODS FOR PROJECT ANALYSIS

- ...the Secretary shall contract with the Academy to conduct a study that includes--
 - (A) a review of state-of-the-art methods;
 - (B) a review of the methods currently used by the Secretary;
- (C) a review of a sample of instances in which the Secretary has applied the methods identified under subparagraph (B) in the analysis of each type of water resources project; and
- (D) a comparative evaluation of the basis and validity of state-of-the-art methods identified under subparagraph (A) and the methods identified under subparagraphs (B) and (C).



Academies "216 Studies"

Committee

- Panel on Peer Review for Project Analysis
- Panel on Project Planning
- Panel on River Basin and Coastal Systems Planning
- Panel on Adaptive Management

216 Studies Coordinating Committee



Len Shabman, Chair, Virginia Tech (federal water resources policy, economics)

Greg Baecher, University of Maryland (project planning methods panel chair)

Don Boesch, University of Maryland (adaptive management panel chair)

Jim Mitchell, **NAE/NAS**, Virginia Tech (peer review panel chair) (geotechnical engineering)

Bob Howarth, Environmental Defense, Boston (biogeochemical processes; oceanography)

Geraldine Knatz, Port of Long Beach (environmental engineering, port and harbor management)

Larry Roesner, Colorado State University (river/coastal systems panel chair) (water resources engineering)

Dan Tarlock, Chicago Kent College of Law (water and environmental law policy)

Vickie Tschinkel, Landers and Parsons, Tallahassee, FL (zoology; environmental law and policy)

Jim Wenzel, **NAE**, Marine Development Associates, Inc., Saratoga, CA (marine engineering and aeronautics)

Gordon Wolman, **NAS**, Johns Hopkins University (water resources management; geomorphology)



WSTB in Development

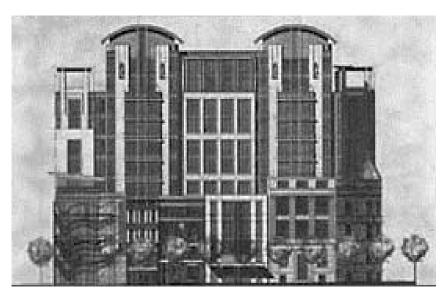
- Assessment of National Water Resources Research Effort
- Valuing Services of Aquatic Ecosystems
- Safety of Nations Water Supplies
- Upper Mississippi River Basin, Watershed and Water Quality Management
- Sustainable Underground Storage
- Columbia River Management

Personal Observations

- Reviews
- Principles & Guidelines
- Watershed-based approach
- Cost-sharing
- Adaptive Management
- Discretionary planning & research \$\$\$



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